COASTAL CONSERVANCY

Staff Recommendation
May 27, 2010

LOWER REDWOOD CREEK RESTORATION

File No. 08-113-01
Project Manager: Joel Gerwein

RECOMMENDED ACTION: Authorization to accept $1,000,000 in grant funds from the U.S. Fish and Wildlife Service disburse these funds and up to an additional $1,000,000 of Conservancy funds to the Golden Gate National Parks Conservancy for implementation of the Lower Redwood Creek Restoration Project.

LOCATION: Muir Beach, Marin County (Exhibit 1)

PROGRAM CATEGORY: Resource Enhancement

EXHIBITS

Exhibit 1: Project Location and Site Map

Exhibit 2: Final Environmental Impact Statement/ Environmental Impact Report (including Mitigation and Monitoring Plan); NPS Record of Decision; Marin Board of Supervisors' Resolution

Exhibit 3: Site photographs

Exhibit 4: Project Letters

RESOLUTION AND FINDINGS:

Staff recommends that the State Coastal Conservancy adopt the following resolution pursuant to Sections 31251-31270 of the Public Resources Code:

"The State Coastal Conservancy authorizes the acceptance of one million dollars ($1,000,000) in grant funds from the U.S. Fish and Wildlife Service, the disbursement of these funds and up to an additional one million dollars ($1,000,000) of Conservancy funds to the Golden Gate National Parks Conservancy ("GGNPC") to implement the Lower Redwood Creek Restoration Project in Muir Beach, subject to the following conditions:

1. Prior to disbursement of any funds, GGNPC shall submit for the review and approval of the Executive Officer of the Conservancy a work plan, schedule, budget, and the names of any contractors to be employed for implementation of the project.
2. GGNPC shall acknowledge Conservancy and USFWS funding by erecting and maintaining signs that have been reviewed and approved by the Executive Officer.

3. GGNPC shall insure compliance with and assist the Conservancy complying with the grant terms of the U.S. Fish and Wildlife Service.
4. GGNPC shall monitor and insure compliance with the provisions of the Mitigation and Monitoring Plan attached to the accompanying staff report as part of Exhibit 2."

Staff further recommends that the Conservancy adopt the following findings:

"Based on the accompanying staff report and attached exhibits, the State Coastal Conservancy hereby finds that:

1. The proposed project is consistent with the current Project Selection Criteria and Guidelines.
2. The proposed authorization is consistent with the purposes and objectives of Chapter 6 of Division 21 of the Public Resources Code (Sections 31251-31270), regarding the enhancement of coastal resources. The Redwood Creek estuary adjacent to the property is identified in the Marin County Local Coastal Program as an area in need of resource enhancement.
3. The Golden Gate National Parks Conservancy is a non-profit organization existing under section 501(c)(3) of the Internal Revenue Service code whose purposes are consistent with Division 21 of the Public Resources Code.
4. The Conservancy has reviewed the Final Environmental Impact Statement and Final Environmental Impact Report (attached to the accompanying staff recommendation as Exhibit 2) adopted by the County of Marin Board of Supervisors on May 13, 2008, pursuant to the California Environmental Quality Act, public comment to the FEIS/FEIR, and the Mitigation Monitoring and Reporting Program developed to mitigate potentially significant environmental effects, and finds that the project as designed avoids, reduces or mitigates the potentially significant environmental effects to a less-than-significant level, and that there is no substantial evidence based on the record as a whole that the project may have a significant effect on the environment, as defined in 14 Cal. Code Regulations Section 15382."

PROJECT SUMMARY:

Staff recommends that the Conservancy authorize the acceptance of one million dollars ($1,000,000) from the United States Fish and Wildlife Service and disbursement of up to two million dollars ($2,000,000) to the Golden Gate National Parks Conservancy to fund the restoration of natural hydrologic and ecological conditions to Lower Redwood Creek at Muir Beach (Exhibit 1), and public access to Muir Beach. Funds authorized for this project would consist of one million dollars ($1,000,000) derived from a United States Fish and Wildlife Service National Coastal Wetlands Conservation grant awarded to the Conservancy for the Lower Redwood Creek Restoration Project, together with up to one million dollars ($1,000,000) of Conservancy funds.

Lower Redwood Creek has been degraded by a century of landscape modifications, and suffers from a lack of connectivity with its floodplain and a high level of sediment deposition in the channel (channel aggradation). The project will restore a functional, self-sustaining ecosystem, re-create habitat for sustainable populations of special status species, reduce flooding by

restoring floodplain connectivity and sediment transport, and provide extensive educational programs and stewardship opportunities. The project is part of a watershed-wide collaboration involving watershed residents, non-profits, local, state, and federal agencies; these groups have successfully completed a number of projects to reduce fine sediment inputs to the creek and to restore floodplain connectivity and fish passage in other reaches. The project has been recognized by the National Park Service (NPS), a state and federal interagency panel for Redwood Creek, and the draft Marin County Watershed Management Plan as the most important need for the overall health of Redwood Creek. This lower reach of the creek is the most unstable and impactted portion of this complex and valuable riparian ecosystem.

The project will restore natural function to 2,500 linear feet of Redwood Creek and 31 acres of adjacent floodplain through the removal of an existing 1,300 linear foot levee, relocation of the channel to the pasture east of the existing channel, reconfiguration of the Muir Beach parking lot and picnic area to erase their effect as a hydraulic obstruction, removal of invasive species such as Cape ivy (*Delairea odorata*), and planting of native vegetation. (See Exhibit 3). The project will also restore and enhance an additional 1.7 acres of freshwater emergent wetlands for the California red-legged frog and one acre of brackish marsh that is currently a monoculture of non-native kikuyu grass. The quality of habitat in the intermittent tidal lagoon for salmonid summer habitat will be enhanced by excavation to allow the tidal lagoon to expand naturally, and engineered log jams will be installed to provide cover for fish. Construction actions are expected to take up to four years, with activities by heavy equipment conducted only during the dry summer and early fall months. In partnership with GGNPC and NPS, the Marin County Department of Public Works will replace the undersized Pacific Way Bridge with a 250-foot-long "causeway" that will span both the channel and its floodplain. The project is designed to accommodate current projections of sea level rise. Although sea level rise may result in flooding of portions of Pacific Way and the parking lot during extreme rain events, hydrologic and geomorphic processes designed into the riparian portion of the project will continue to function.

Project Need

Redwood Creek, in southern Marin County is one of the most natural creeks in the San Francisco Bay Area, with extremely high natural resource values. However, the mouth of the creek at Muir Beach is the most disturbed reach in the Redwood Creek watershed. Modifications for agriculture, recreation, and road construction made between the 1880s and 1980s have highly confined the lower 2,500 linear feet of channel and its floodplain, thereby reducing the conveyance capacity of the channel, severely limiting the extent of connected floodplain, and causing rapid aggradation of the creekbed (Exhibit 1). These physical effects have limited the quantity and quality of winter habitat for the federally and state-listed endangered coho salmon (*Oncorhynchus kisutch*) and federally threatened steelhead trout (*O. mykiss*) in Redwood Creek. Fish biologists consider the lack of sufficient winter habitat to be one of the primary limiting factors for the coho salmon in Redwood Creek. The channel confinement has created a geomorphically unstable channel which is highly subject to avulsion (jumping its course) into the Green Gulch pasture, located east of the levee road (Exhibits 1 and 3). Only two small culverts allow passage between the pasture and the creek channel in the 1,300-foot creek reach constrained by the levee road (Exhibit 3).

Resolution of Conflicts between Habitat, Flood Control, and Visitor Access

The confinement of the channel has also contributed to annual winter flooding and closure of the county-owned Pacific Way road (Exhibit 3) which is the only access to some Muir Beach

residences and the public beach parking lot, and this, in turn, has led to on-going public pressure to dredge the creek and remove logjams. Dredging the creek and removing large woody debris severely degrades habitat for coho, steelhead, and other aquatic species. Muir Beach is a popular and highly visited NPS site, with approximately 260,000 visitors annually. However, the visitor parking lot contributes to the confinement of the channel because it consists of a 500-foot-long fill pad across the floodplain that has severely limited the area available for conveyance of high flows. The proposed project will reconfigure the parking to minimize its impacts on the adjacent lagoon and floodplain area, but maintain its current capacity to ensure adequate public access to the beach.

Education

The project includes a significant environmental and cultural education component. The location and popularity of the site provides an opportunity for the educating the public about wetlands restoration and cultural resources. Muir Beach is located along the Pacific Coast Highway (Route 1), a designated National Scenic Byway, and is only 6 miles down the road from the Muir Woods National Monument. While large numbers of tourists and local residents visit Muir Beach, many of these visitors are unaware of the pressing need for restoration of lower Redwood Creek, and of the ongoing restoration efforts in the rest of the Redwood Creek watershed. It is especially important to provide education about the fish and wildlife in lower Redwood Creek in order to inform people who are concerned about flooding and are advocating for dredging of the creek. Furthermore, important subsurface archaeological resources, including at least 3 shell middens from the Coast Miwok Native American period and earlier, are present in the project area,[1] but there are no current educational programs related to the Coast Miwok use of the site. The need for an education component to the restoration project is compounded by the expected ongoing visitor use of the site during the restoration. Beachgoers will come to Muir Beach and find that construction activities with heavy equipment are underway. It will be very important to explain what is happening and why, and to offer opportunities for the public to participate.

The GGNPC is highly qualified to carry out this project, as evidenced by their role in the successful completion of many complex restoration projects in the Golden Gate National Recreation Area (GGNRA). The GGNPC worked with the NPS project manager for the Lower Redwood Creek restoration to successfully complete creek and floodplain restoration work upstream on the former Banducci farm, and has been managing initial project construction in 2009 and 2010.

Site Description: The Redwood Creek watershed in Marin County is outstanding in coastal California as a relatively intact ecological unit, with 95% of its lands under state, federal or other governmental ownership. Redwood Creek itself supports the southernmost healthy population of the coho salmon in the United States, making it an extremely important resource for a species of great concern and public interest. Lower Redwood Creek is located adjacent to the town of Muir Beach. The project area consists of a mixture of natural habitats and developed areas (Exhibit 3). Natural habitats include: lower Redwood Creek itself and the willow-alder riparian forest and scrub along its banks; emergent cattail marsh and degraded seasonal wetlands in the former Green Gulch farm pasture south of the levee; and Muir Beach itself, which includes a small area of dune habitat and a small coastal lagoon. Developed portions of the project area include the

[1] These cultural resources will be avoided during construction. See Exhibit 2, Record of Decision at pp. 12-13.

levee road separating Redwood Creek from the Green Gulch pasture, the visitor parking lot, and Pacific Way, including the undersized bridge over the creek.

More than 46% of the lower Redwood Creek floodplain wetlands have become disconnected from the creek channel due to the many landscape modifications constructed there over the last century. Approximately 38% of the floodplain wetlands have been converted from riparian scrub to pasture, although grazing has been discontinued in this pasture for some years. Lost and degraded riparian scrub and forest has decreased the habitat for riparian birds, including state listed species such as the willow flycatcher (*Empidonax traillii*). In addition, habitat quality in floodplain wetlands has been degraded by invasive non-indigenous species. Cape ivy (*Delairea odorata*) dominates the understory in much of the riparian scrub and forest within the project area. Kikuyu grass (*Pennisetum clandestinum*) dominates a one-acre brackish marsh adjacent to Redwood Creek's tidal lagoon (Exhibit 3).

The site supports a remnant population of the federally listed threatened California red-legged frog (*Rana aurora draytonii*), but its habitat is extremely unstable, maintained by the same structures that make the overall creek system dysfunctional. The levee constructed in the 1960's to confine the creek allows ponding and emergent vegetation growth in the Green Gulch pasture, thereby providing suitable breeding habitat for the frog (Exhibit 3). However, actions to prevent flooding taken in recent years have lowered the water table in the frog's breeding area, making it dry up before tadpoles have time to metamorphose. For this reason, an artificial flashboard structure on a culvert under the levee is used to provide adequate ponding for the frog. While this approach has been successful, it is not reliable over the long term.

Project History: The Conservancy has previously recognized the importance of the Redwood Creek watershed in Marin to coho salmon and steelhead, and to the public who enjoy the many protected lands within the watershed, including Muir Woods, Muir Beach, and Mount Tamalpais State Park. In 2007, the Conservancy made three grants to support the restoration of the Redwood Creek watershed. One grant provided funds to the County of Marin to restore fish passage for coho salmon by removing the barrier in Redwood Creek at Kent Canyon in Muir Woods; a previous Conservancy grant in 2005 funded design and engineering for the Kent Canyon project and other fish passage improvement projects. Two other 2007 Conservancy grants provided funds to support the efforts of the Golden Gate National Parks Conservancy (GGNPC) and the North Bay Conservation Corps to remove invasives, reduce erosion, and plant natives in the Redwood Creek watershed. In 2008, the Conservancy granted funds to the GGNPC to restore habitat and improve public access along the Dias Ridge trail, a popular part of the Bay Area Ridge Trail that climbs from the project area at Lower Redwood Creek into Mount Tamalpais State Park. The NPS and GGNPC approached the Conservancy for funding assistance in Fall 2007, and Conservancy staff has worked with NPS and GGNPC staff to identify potential funding sources since that time, including the National Coastal Wetlands Conservation Grant application.

PROJECT FINANCING:

Coastal Conservancy	$1,000,000
USFWS*	1,219,220
NPS	4,356,900
CDFG	576,581
Other Sources (TBD)	3,597,299
Total Project Cost	**$10,750,000**

*USFWS funds include a $1,000,000 National Coastal Wetlands Conservation grant to the Conservancy and a $219,220 North American Waterfowl Conservation Act grant directly to the grantee.

The Conservancy funds for this project are expected to derive from the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 (Proposition 84) funds designated for the San Francisco Bay Area Conservancy. This funding source may be used for the protection of coastal waters and watersheds in the San Francisco Bay Area, pursuant to the Conservancy's enabling legislation, Division 21 of the Public Resources Code. The project is consistent with the Conservancy's enabling legislation as described below. Public Resources Code Section 75060(c) specifies that not less than twenty percent of the Conservancy funds allocated to the San Francisco Bay Area program are to be expended on projects in watersheds draining directly to the Pacific Ocean.

Another requirement of Proposition 84 is that for projects that restore natural resources, the Conservancy give priority to projects that meet one or more of the criteria specified in Section 75071. The proposed restoration project satisfies the following specified criteria: (a) **Landscape/Habitat Linkages**, as detailed in the Project Description Section, the project will facilitate wildlife movement, botanical transfer, and help sustain a complex riparian system which supports several threatened and endangered species, (b) **Watershed Protection** – the project will contribute to long-term protection of and improvement to the water and biological quality of Redwood Creek and the nearshore area of the Pacific Ocean; and (e) **Non-State Matching Funds** –as discussed above, the U.S. Fish and Wildlife, the National Park Service and other funders will provide significant non-state matching funds.

The balance of the funds provided under this authorization is to be provided by a grant from the USFWS National Coastal Wetlands Conservation Grant to the Conservancy specifically for the Lower Redwood Creek Restoration. As indicated above, a substantial amount of funds remains to be raised for the project. The NPS and GGNPC are actively engaged in fundraising for the project. Construction for the project is proceeding in phases that will each have independent utility, such that habitat and other improvements will be robust to delays in implementation of the full project.

CONSISTENCY WITH CONSERVANCY'S ENABLING LEGISLATION:

The proposed project is undertaken pursuant to Chapter 6 of Division 21 of the Public Resources Code (Sections 31251-31270), as follows:

Pursuant to Section 31251, the Conservancy may award grants to non-profit organizations for the purpose of enhancement of coastal resources that have suffered loss of natural values because of human-induced events (e.g., channelization of lower Redwood Creek, the erection of levees to

isolate the creek from its floodplain, the construction of the Muir Beach parking lot adjacent to the creek, and the construction of an undersized bridge constraining creek movement). Consistent with this section, the proposed authorization provides funds to the GGNPC to remove or reconfigure the levee road, parking lot, and bridge, and restore natural values to wetlands in the project area.

Pursuant to Section 31252, all areas proposed for resource enhancement should be identified in a certified local coastal plan or program as requiring public action to resolve existing or potential resource problems. The Marin County Local Coastal Plan Unit I Land Use Plan, certified on April 1, 1981, identifies coastal zone creeks as sensitive habitats for many species of birds and fish. Redwood Creek is specifically highlighted (The Marin County Local Coastal Program Unit 1 Land Use Plan, Pg. 17). Sedimentation, protection of riparian habitat, and enhancement of salmonid habitat are identified as the key concerns for protecting the aquatic resources of Redwood Creek (ibid, pp. 15-21). The project will restore sediment transport capacity to the creek and restore connectivity with the floodplain, thereby significantly reducing sedimentation. The project will protect and restore riparian habitat in the former Green Gulch pasture and will enhance and restore salmonid habitat by providing connectivity with floodplain wetlands, installing logjams, and greatly reducing the need to dredge the creek. In addition, 24 acres of the 38 acre project area currently consists of federal parkland, and the NPS has acquired a conservation easement over the remaining 14 acres (Green Gulch pasture). The LCP requires that federal parkland in the coastal zone be managed in a manner consistent with the Coastal Act, which requires the restoration of the overall quality of the coastal zone's environment and its natural resources.

Pursuant to Section 31253, "[the] Conservancy may provide up to the total of the cost of any coastal resource enhancement project, including the state or local share of federally supported projects…." after an assessment of funding generally available for coastal resource enhancement projects, the fiscal resources of the applicant and the urgency of the project relative to other eligible coastal resource enhancement projects. The proposed contribution by the Conservancy was determined based on application of priority criteria, as discussed below, and after taking into account other available resources and the matching contributions to the project by other funding sources.

CONSISTENCY WITH CONSERVANCY'S 2007 STRATEGIC PLAN GOAL(S) & OBJECTIVE(S):

Consistent with **Goal 5, Objective B** of the Conservancy's 2007 Strategic Plan, the proposed project will contribute to the protection, restoration, and enhancement of coastal habitats.

Consistent with **Goal 5, Objective D** of the Conservancy's 2007 Strategic Plan, the proposed project will target prevention and eradication of non-native invasive species that threaten important coastal habitats.

CONSISTENCY WITH CONSERVANCY'S PROJECT SELECTION CRITERIA & GUIDELINES:

The proposed project is consistent with the Conservancy's Project Selection Criteria and Guidelines, last updated on September 20, 2007, in the following respects:

Required Criteria

1. **Promotion of the Conservancy's statutory programs and purposes:** See the "Consistency with Conservancy's Enabling Legislation" section above.
2. **Consistency with purposes of the funding source:** See the "Project Financing" section above.
3. **Support of the public:** The project enjoys broad support, including from the California Department of Fish and Game, the USFWS, the Marin County Board of Supervisors, the San Francisco Bay Joint Venture, California State Parks, the San Francisco Zen Center, the Golden Gate Parks Conservancy, PRBO Conservation Science, and the Marin Municipal Water District. Support letters are attached as Exhibit 4.
4. **Location:** The proposed project would be located within the coastal zone of Marin County.
5. **Need:** Conservancy participation is needed both to accept federal funds for the project that fill an important funding gap, and to provide state-share funds for the federal grant.
6. **Greater-than-local interest:** The project is the critical component of a multi-pronged effort to restore the entire Redwood Creek watershed. The watershed is outstanding in coastal California as a relatively intact ecological unit, with 95% of its lands under state, federal or municipal ownership, and includes parks such as Muir Woods, Muir Beach, and Mount Tamalpais State Park that are heavily used and highly valued by visitors from the area and around the world. Redwood Creek itself supports the southernmost healthy population of the coho salmon in the United States, making it an extremely important resource for a species of great concern and public interest.
7. **Sea level rise vulnerability:** Planning for this project has considered potential impacts from sea level rise. For a focused discussion of these analyses, see Chapter 6: Responses to Comments in the Final EIS/EIR (Dec. 2007), where a Master Response on questions about Sea Level Rise is provided. Hydrologists modeled the effects of sea level rise first using the 2001 IPCC projections, then the 2007 IPCC projections and, later, using a worst-case scenario if sea level rise exceeded IPCC projections. In general, proposed actions accommodate adjusting hydrological conditions, including sea level rise, to the maximum extent possible because the actions will remove impediments to both flows and connectivity; therefore both flow patterns and habitats will adjust to any rise in sea level better as a result of project actions than without them. Although sea level rise may result in flooding of portions of Pacific Way and the parking lot during extreme rain events, hydrologic and geomorphic processes designed into the riparian portion of the project will continue to function. The project was evaluated for sea level rise of approximately 2 ft over 100 years, based on the predictions of the 2007 IPCC report, and a worst case scenario of up to 1 meter over 100 years These analyses found that even these extreme events "would not necessarily be incompatible with the restoration of the project site." Some of the coastal processes would shift inland, with tidal influence extending further inland by about 800 feet and salt-tolerant vegetation also extending further inland. Water surface elevations in the channel would be raised during flood events due to sea level rise. Analyses found that the area with higher surface water elevations extends further upstream than under the existing condition, but it would not extend as far upstream as the existing road, Pacific Way. The county's proposed Pacific Way bridge, a 250 ft long causeway replacing the current 25 ft long bridge,

is designed to clear a 100-year storm event, including the likely effects of sea level rise. The bridge will provide a level of accessibility over the channel and floodplain that has not been available to date. The project involves moving the parking lot out of its current position in the lower floodplain in order to restore floodplain wetlands and connectivity with the channel. In addition to the immediate ecological benefits provided by this shift, the new parking lot would be less vulnerable to flooding due to sea level rise because it will be moved away from direct wave action. Project benefits such as enhanced sediment transport and connectivity of the creek with its floodplain would not be eliminated in the face of sea level rise.

Additional Criteria

8. **Urgency:** Salmonid habitat in Redwood Creek is imminently threatened by creek avulsion and dredging. Each winter, natural resource managers at GGNRA, as well as local residents, virtually hold their breath as storm events approach, wondering whether this will be the event to cause either an avulsion of the very unstable channel or a highly damaging flood event. A channel avulsion would be highly undesirable prior to project implementation because it would worsen the disconnection of the channel from the floodplain and, due to the levee, further obstruct fish passage. Each year that passes without project implementation prolongs the period when the endangered and threatened populations of juvenile salmonids face inadequate habitat conditions in Redwood Creek during winter flows.
9. **Resolution of more than one issue:** Realignment of the channel and construction of a longer bridge (bridge construction will be funded by Marin County and its partners) will greatly reduce flooding of Pacific Way at the same time as it restores natural hydrologic and sediment transport processes to Redwood Creek and its floodplain wetlands. The result will be a restored creek and floodplain, and an adjacent residential community better able to live in harmony with it.
10. **Leverage:** See the "Project Financing" section above.
11. **Conflict resolution:** Frequent flooding of homes and of Pacific Way has led to strong pressure from local residents to dredge Redwood Creek. This pressure has generally been resisted by the NPS due to dredging impacts on salmonids and other wildlife. As noted above, the project will alleviate flooding and restore habitat, thus resolving the ongoing conflict.
12. **Innovation:** The project's approach emphasizes restoring ecosystem processes, such as sediment transport, channel migration, channel-floodplain interaction, and seasonal and long-term beach change. This innovative approach should result in a dynamic system that is as self-sustaining as possible and addresses anticipated sea level rise impacts.
13. **Readiness:** The project is in a high state of readiness, with significant funding secured and design and permitting nearing completion. Regulatory permits that have already been obtained include a Concurrence of No Adverse Effect determination from the State Historic Preservation Office, a Consistency Determination from the California Coastal Commission, and a Biological Opinion from the U.S. Fish and Wildlife Service, and permits from the U.S. Army Corps of Engineers (the Corps) and the Regional Water Quality Control Board under Sections 404 and 401 of the Clean Water Act (CWA). The Corps has already certified the jurisdictional wetland delineation, provided verbal approval of the proposed actions as the

least environmentally damaging practicable alternative under CWA Section 404(b)(1) and concluded its public notification process of the project. The applicant has demonstrated that it has the expertise, local public support, and administrative capability necessary to commence and complete the project in a timely fashion.

14. **Realization of prior Conservancy goals:** The project supports Conservancy goals of restoring coho salmon habitat across its current range, and supporting the restoration of Redwood Creek specifically.

15. **Cooperation:** The project involves a partnership between multiple agencies and organizations. The NPS is the lead agency for project management and implementation. The GGNPC will coordinate construction management, as well as volunteer stewardship activities by a broad array of groups, including local schools, businesses, and senior citizen groups. The Marin County Department of Public Works will manage the design and implementation of the new bridge to be constructed over the new alignment of Redwood Creek, and will work with County supervisors to raise funds for bridge construction.

16. **Vulnerability from climate change impacts other than sea level rise:** The project's approach emphasizes restoring ecosystem processes, such as sediment transport, channel migration, channel-floodplain interaction, and seasonal and long-term beach change. This approach should result in a dynamic system that is as self-sustaining as possible and addresses anticipated changes in local climate conditions. In addition, control of invasive species is an important project component that will enhance the resiliency of the Lower Redwood Creek ecosystem to disturbances related to climate change, such as increased potential for invasive species and wildfire. It is possible that the frequency of some moderate flow events may increase due to climate change. This project accommodates this change well because it is designed to allow better conveyance of the system by connecting the channel to its natural floodplain and providing room for the channel morphology to shift overtime.

17. **Minimization of Greenhouse Gas Emissions**: Construction activities could have a moderate adverse impact due to the emissions from construction equipment, but the project is requiring contractors to use low-emission diesel, late model engines, filters and other equipment to reduce emissions by up to about 20%. Some exhaust from equipment has been minimized by utilizing a disposal site for excavated material that is less than a mile from the project site, thereby minimizing the distance of trucking. The overall project design maximizes the reuse of excavated material on-site as much as possible. The construction-phase impacts are temporary, and the overall project does not have a significant affect on greenhouse gas emissions. It may help reduce emissions due to a public access component to construct an ADA accessible path from Route 1 along Pacific Way to the project site. This path will allow a designated bus stop to be added at Pacific Way and Route 1, providing public transit options for visitors. By linking this bus stop with the Muir Woods Shuttle, which operates during summer months, a visitor could leave a ferry in San Francisco, catch the shuttle in Sausalito, and arrive at Muir Beach without the use of a car.

CONSISTENCY WITH LOCAL COASTAL PROGRAM POLICIES:

See "Consistency with Conservancy's Enabling Legislation" above for discussion of project consistency with the Marin County Local Coastal Program.

COMPLIANCE WITH CEQA:

The NPS and the County of Marin circulated for public review between December 22, 2006 and February 23, 2007 a Draft EIS/Draft EIR, and issued an FEIS/FEIR on December 21, 2007, pursuant to the California Environmental Quality Act. An Amendment to the FEIS/EIR was issued in March 2008 and on May 13, 2008, the Marin County Board of Supervisors certified the Lower Redwood Creek Restoration Project FEIS/EIR. (Exhibit 2). The FEIS/FEIR identifies potentially significant impacts from the chosen alternative, but determines that they could be mitigated to "less than significant" levels.

The major adverse environmental impacts of the restoration project and the adopted mitigation measures are summarized in the following table:

Category	**Potentially Significant Impact**	**Mitigation Measures that will reduce the potentially significant impact to a "less than significant" level**
Air Quality	1. Emission of pollutants during construction.	1a. NPS will implement air quality best management practices (BMPs) recommended by the BAAQMD such as watering active construction areas, covering trucks hauling sediment, limiting the area subject to construction disturbance at any one time, and limiting traffic speeds on unpaved access roads. 1b. Implement a plan to achieve a project-wide heavy duty off-road vehicle fleet average 20 percent NOX reduction and 45% particulate reduction compared to the most recent ARB fleet average at time of construction through measures such as use of late model engines, low-emission diesel products, alternative fuels, and engine retrofit technology. 1c. Total PM10 emissions shall be maintained below the 80 ppd standard. One way to achieve this may be to limit the number of fill disposal trips to 46 round-trips per day (based on 10-CY trucks).
Noise	2. Construction-related noise	2a. Construction limited as much as possible to the hours of 8 AM-5 PM, M-F, and 10 AM-4 PM, Saturday. Equipment will have sound control devices. Equipment idling and engine revving will be limited. Noise-reducing enclosures will be constructed around stationary equipment. Use vibratory pile driving rather than impact pile driving for bridge construction if feasible. 2b. A Noise Control Plan will be prepared and

		implemented, including measures such as those described in 2a above. 2c. Disseminate essential information about the project prior to construction to residences within 1,000 ft and implement a complaint/response tracking program.
Biological Resources	3. Short-term loss of mature riparian habitat for wildlife. 4. Short term degradation of salmonid habitat due to temporary increase in turbidity and water temperature. 5. Loss or degradation of California red-legged frog (CRLF) habitat due to riparian habitat restoration. 6. Reduction in songbird nesting success due to increase in corvids (e.g. crows) facilitated by improved public access. 7. Reduction in bat populations due to reduction in emergent marsh foraging area and short term loss of riparian snags. 8. Direct mortality and stress to fish due to pile driving and construction related to bridge replacement. 9. Potential loss of winter fish habitat. 10. Impacts to special-status plant and animal species during construction. 11. Increase in invasive	3. Preconstruction riparian habitat survey and possible installation of nesting boxes for cavity-nesting birds. 4. Turbidity and water quality monitoring and implementation of corrective measures if necessary (see Water Quality Measures #15 and 16 below). 5a. Creation of California Red Legged Frog (CRLF) breeding habitat in Green Gulch pasture and at the Banducci restoration site upstream. Reintroduce CRLF to the Banducci site. 5b. Monitor CRLF population. Augment CRLF population if surveys find fewer than two CRLF for two consecutive years. 6. Supply site with wildlife-proof trash receptacles and educate visitors regarding negative impacts of litter. 7. Potential bat-roosting trees to be removed as part of the project will be removed in warm weather, after searching for bat roosts, and creating noise and vibrations on the tree to prevent bat mortality. 8a. Construction will take place during the dry season to the extent possible. 8b. All permanent pile-driving activities will be conducted between July 15 and October 15 to avoid the peak migration of adult and juvenile coho salmon. All reasonable measures, including the use of vibratory hammers, dewatering, etc., will be incorporated to ensure that peak underwater sound pressure levels in Redwood Creek remain below 180 dB at a distance of 10 meters from the pile; all temporary and permanent pile-driving activities will be monitored by a qualified fish biologist during the entire project. 9. During final design, NPS will ensure that potential winter rearing habitat created by the project provides a net increase in the areal extent of habitat. 10. Biologists will survey construction and staging areas for special-status species prior to their use. No construction activity will occur within 50 ft of active bird nests. Special-status species such as CRLF will be relocated prior to construction, an exclusion fence

	weeds and loss of native plant species.	will be erected around existing CRLF habitat to prevent re-entry, and the fence will be checked daily during construction. 11. Conduct follow-up weed control and revegetation activities to establish appropriate native plant species.
Water Quality	12. Short term (3-4 yr) increase in turbidity after storm events and water temperature while new riparian vegetation is becoming established. 13. Short-term impacts to water quality due to construction.	12a. Monitor turbidity in Redwood Creek. If significant elevated turbidity is a persistent problem, major sources of sediment will be identified and treated with erosion control measures. 12b. Monitor water temperature and other water quality parameters, and implement BMPs to correct persistent and significant water quality problems. For example, long willow stakes may be tied together to create "rafts" that float on the water surface, thus creating shade and cool pockets of water. 13. Obtain coverage under the National Pollutant Discharge Elimination System (NPDES) General Construction Permit and implement Best Management Practices, such as conducting certain activities only in the dry season and covering material loads. This measure includes the preparation and implementation of a Stormwater Pollution Prevention Plan and a Spill Prevention and Control Plan.
Cultural Resources	14. Potential disturbance of shallow archaeological site ("the Fan site") due to removal on non-native invasive Harding grass and/or truck traffic. 15. Disturbance of unidentified cultural resources during construction. 16. Compaction of archaeological site CA-MRN-674 due to trail and/or bridge construction.	14. Workers will receive education regarding the types of cultural resources potentially onsite and the procedures to follow if cultural resources are encountered. Fan site will be fenced when truck traffic will be present in the area. 15. Workers will receive education regarding the types of cultural resources potentially onsite and the procedures to follow if cultural resources are encountered. An archaeological monitor and representative of the Federated Indians of the Graton Rancheria (FIGR) (Coast Miwok) will be present during ground disturbing activities within 100 feet of recorded archaeological resources. 16. Additional subsurface surveys will be conducted if necessary and the appropriate equipment will be used to avoid compaction. If compaction is unavoidable, the FIGR, Marin County, the NPS, and the State Historic Preservation Office will consult to determine appropriate measures.
Recreation	17. Temporary (3 consecutive construction seasons) disturbance of recreational visitors and	17. Education regarding the restoration project, opportunities to participate in site restoration, and redirection to alternative beach sites, will reduce the disturbance felt by most visitors. See also noise

	partial closure of project area due to construction activity. 18. Temporary increased safety risks to recreational visitors, particularly equestrians, due to construction activity.	mitigation measure #2c. 18a. All active construction, staging, and stockpile areas will be fenced and posted to render them inaccessible to the public. When construction equipment travels outside the fenced area, flaggers, traffic cones and/or high visibility temporary construction fencing will be used to delineate travel routes and alert the public. 18b. Public notices addressing horse and equestrian safety will be posted on the NPS/GGNRA website, at all area equestrian facilities, at trailheads that serve equestrians, and on fencing at active construction sites. Notices will alert the public to the location, nature, and duration of construction activities and the potential for construction noise to frighten horses. Riders will be cautioned regarding the risk of horses shying and/or bolting, the risk of injury, and the risk of horses injuring themselves. Notices will provide information on alternate trail routes and other area equestrian facilities for use during construction.
Public Access/Traffic	19. Short term increase in traffic and loss of parking due to construction mobilization, materials deliveries, and truck trips associated with fill disposal.	19. NPS and the County, in coordination with Caltrans, shall develop and implement traffic control plan(s) for construction of the project. The plan shall reduce the effects of construction on the roadway system in the project area throughout the construction period.
Public Services	20. Non-renewable resources could be used in a wasteful or inefficient manner during construction. 21. Construction could result in short term increased demand or conflict with utility lines or services systems.	20. Sustainable building practices will be employed. 21. Utility services will be mapped and avoided where possible. Any damage to utilities will be avoided. Residents will be notified of any temporary disruption in utility services.
Human Health and Safety	22. Excavation could expose people to undiscovered or undocumented sources of contamination	22. Construction workers will be trained to identify hazardous contamination. If contamination is encountered, NPS will stop work and implement hazardous materials investigation/remediation.

In addition to the potential significant impacts identified in the table; the mitigation and monitoring plan provides standard spill response and construction-related erosion control measures as part of the Mitigation Monitoring and Reporting Program. (Appendix C to Exhibit 2).

On May 13, 2008, the Marin County Board of Supervisors considered and adopted the FEIS/FEIR together with the Amendment and the associated Mitigation Monitoring and Reporting Program, with the finding that the project, as mitigated, will not have any significant adverse effects on the environment (Exhibit 2).

Staff has independently reviewed the FEIS/FEIR, the public comment, and the Mitigation Monitoring and Reporting Program and concurs that there is no substantial evidence based upon the whole record that the project as mitigated will have a significant adverse effect on the environment. Staff therefore recommends that the Conservancy find that the project as designed avoids, reduces or mitigates the potentially significant environmental effects to a less-than-significant level, and that there is no substantial evidence based on the record as a whole that the project may have a significant effect on the environment, as defined in 14 Cal. Code Regulations Section 15382.

Upon approval and concurrence by the Board, staff will file a notice of determination.